78-3-4-18/38

AUTHORS: Yakovlev, V. Ya., Chervonovskiy, V. I.

TITLE: On the Theory of the Stability of Binary Mixtures (K teorii ustoychivosti binarnoy smesi)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 936-938 (USSR)

ABSTRACT: In the present paper the investigation of the systems of binary mixtures was carried out, which mix in similar phase and at random proportion. In these investigations the integral equation by N. N. Bogolyubov was used for

$$kT\ln \mu_{a,b}(r) = F_{a,b}(r) + \sum_{c} \lambda \frac{n_c}{r} \int_0^{\infty} \varrho \left\{ \int_{|r-\varrho|}^{|r+\varrho|} tE_{a,c}(t)dt \right\} \left\{ \mu_{c,b}(\varrho) - 1 \right\} d\varrho,$$

$$E_{a,c}(t) = \int_{\infty}^{t} \mu_{a,c}(t) \frac{dF_{a,c}(t)}{dt} ; \; c = 1,2;$$

k = Boltzmann constant

T = temperature

For the construction of binary systems the diagram of binary

Card 1/2

On the Theory of the Stability of Binary Mixtures

mixtures was constructed by means of the mentioned equation by Bogolyubov and by a graphical method.
The investigations of the stability of binary mixtures by the method of statistical physics explain the formation of the solidus- and liquidus curve only by molecular forces.
The graphical connection between t^{o} and the concentration of the components is similar to the graphical liquidus-solidus curve. There are 1 figure and 5 references, all of which are Soviet.

ASSOCIATION: Chernovitskiy universitet, Kafedra teoreticheskoy fiziki (Chernovtsy University, Chair for Theoretical Physics)

SUBMITTED: June 25, 1957

YAKOVLEV, Valeriy Yakovlevich; ZAKHAR'YEV, N.I., otv. red.

[Chemical composition and nutritive value of the grass stand of pastures and hayfields in the upland Tien Shan] Khimicheskii sostav i pitatel'nost' travostoia pastbishch senokosov syrtov Tian'-Shania. Frunze, Izd-vo AN Kirgiz.SSR, 1963. 114 p. (MIRA 16:11)
(Tien Shan--Pastures and meadows)

YAKOVLEV V. YA.

ABRAMOVA, Zh.I., kand. med. nauk; ANICHKOV, S.V., prof.; BELEN'KIY, M.L., prof.; VAL'DMAN, A.V., doktor med. nauk; VEDENEYEVA, Z.I., kand. med. nauk; VINOGRADOV, V.M., kand. med. nauk; GERSHANOVICH, M.L., kand. med. nauk; GINETSINSKIY, A.G., prof.; GORBOVITSKIY, S.Ye., prof.; GREBENKINA, M.A., dotsent; GREKH, I.F., dots.; DENISENKO, P.P., kand. med. nauk; D'YACHENKO, P.K., kand. med. nauk; ZHESTYANIKOV, V.D., kand. med. nauk; ZAUGOL'NIKOV, S.D., prof.; ZEYMAL', E.V., kand. med. nauk; ISKAREV, N.A., kand. med. nauk; KARASIK, V.M., prof.; KIVMAN, G.Ya., kand. med. nauk; KOZLOV, O.D., kand. med. nauk; KROTOV, A.I., doktor veter. nauk; KUDRIN, A.N., doktor med. nauk; LAZAREV, N.V., prof.; LAPIN, I.P., kand. med. nauk; MEL'NIKOVA, V.F., prof.; MESHCHERSKAYA, K.A., prof.; MIKHEL'SON, M.Ya., prof.; MOSHKOVSKIY, Sh.D., prof.; PADEYSKAYA, Ye.N., kand. med. nauk; PARIBOK, V.P., prof.; PERSHIN, G.N., prof.; PLANEL'YES, Kh.Kh., prof.; PONOMAREV, G.A., prof.; POSKALENKO, A.N., kand. med. nauk; MUKHIN, Ye.A., dots.; ROZOVSKAYA, Ye.S., dots.; RYBOLOVLEV, R.S., starshiy nauchnyy sotr.; SALYAMON, L.S., kand. med. nauk; SAFRAZBEKYAN, R.R., kand. biol. nauk; TIUNOV, L.A., kand. med. nauk; TOMILINA, T.N., dots.; FELISTOVICH, G.I., kand. med. nauk; FRUYENTOV, N.K., kand. med. nauk; KHAUNINA, R.A., kand. med. nauk; TSYGANOV, S.V., prof.[deceased]; CHERKES, A.I., prof.;

(Continued on next card)

ABRAMOVA, Zh.I.----(continued) Card 2.
CHERNOV, V.A., doktor med. nauk; SHADURSKIY, K.S., prof.; YAKOVLEV, V.Ya., doktor khim. nauk; MASHKOVSKIY, M.D., red.; NIKOLAYEVA, M.M., red.; RULEVA, M.S., tekhn. red.; CHUNAYEVA, Z.V., tekhn. red.

[Manual on pharmacology] Rukovodstvo po farmakologii. Leningrad, Medgiz. Vol.2. 1961. 503 p. (MIRA 15:1)

1. Deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR (for Anichkov, Karasik, Cherkes). 2. Chlen-korrespondent Akademii meditsinskikh nauk SSSR (for Belen'kiy, Ginetsinskiy, Moshkovskiy, Planel'yes).

(PHARMACOLOGY)

39157
S/120/62/000/003/021/048
E192/E382

9,3280

AUTHORS: Leont'yev, N.I. and Yakovlev, V.Ya.

TITLE: A pulse-generator for displaying probe characteristics

PERIODICAL: Pribory i tekhnika eksperimenta, no. 3, 1962, 93 - 96

TEXT: The generator is designed for the display of probe characteristics in electrode-less pulse discharges. The measurement system employed is illustrated in Fig. 1. A signal from the pulse generator (ГИ) is applied to a double electrical probe through a separating transformer T_{p1} and a resistance r. The current in the probe circuit is primarily dependent on the internal resistance of the probe gap, provided this is much smaller than r. The voltage developed across r is therefore proportional to the probe current and this is applied to the oscillograph (see Fig. 1) through the transformer T_{p2}. The pulse applied to the probes has a linearly rising portion from -60 V to 0, a flat portion and a linearly rising portion from 0 to +60 V, the overall duration of the pulse being 60 μs. The front edge of the

X

Card 1/4

S/120/62/000/003/021/048
E192/E382

A pulse-generator for ....

pulse corresponds to the triggering of the time base of the oscilloscope. Also 15 µs after termination of the pulse, when the investigated discharge is extinguished, the time base is triggered again and a horizontal line corresponding to 0 probe current is displayed. The pulse-generator is based on 2 vacuum tubes and 9 thyratrons. The 2 vacuum tubes are double triodes and are used as anode-grid limiters. An RC phase-shift network is inserted between the limiter so that its output pulses can be shifted with respect to each other by 10 - 50 µs. The pulse from the first limiter is applied to the grid of the first thyratron which produces a fast pulse at its anode. This pulse ignites the next thyratron and actuates the supply of the investigated discharge. The pulse of the second thyratron has a duration of about 10 µs and an amplitude of 140 V and this is applied to the first grid of the third thyratron T_3; the second grid of T_3 is also normally at a negative potential so that T_3 becomes ignited only when it receives a pulse from the second limiter.

Card 2/4

S/120/62/000/003/021/048
E192/E382

A pulse-generator for ....

T_3 produces a pulse for triggering the time base of the oscillograph and for igniting the pulsing thyratron T_4. A special circuit based on 2 thyratrons, T_6 and T_7, is used for the secondary triggering of the time base. T_6 of this circuit is triggered simultaneously with T_4. The cathode circuit of T_4 produces in the negative portion of the probe voltage; it also triggers the next thyratron T_5 after a delay of 15 μs, which produces the positive portion of the voltage. These voltages are combined in the secondary winding of a double transformer connected in the cathode circuits of T_4 and T_5. A detailed circuit diagram of the pulse-generator is given. The authors thank N.V. Aleksandrov for taking part in the construction of the generator. There are 5 figures.

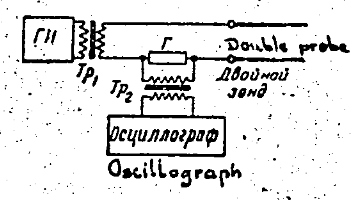
Card 3/4

A pulse-generator for S/120/62/000/003/021/048
E192/E382

ASSOCIATION: Fiziko-tekhnicheskiy institut AN GruzSSR
(Physicotechnical Institute of the AS Georgian SSR)

SUBMITTED: June 27, 1961

Fig. 1:



Card 4/4

YAKOVLEV, V.Ya.

Redisigning of the bubble-cap tower. Gidroliz. i lesokhim. prom. 16 no.6:27 '63. (MIRA 16:10)

1. Priozerskiy sul'fitno-spirtovoy zavod.

YAKOVLEV, V.Ya.

Two arrangements for attaching dephlegmators. Gidroliz. i lesokhim. prom. 11 no.3:24 '58. (MIRA 11:5)

1. Priozerskiy sul'fitno-spirtovoy zavod.
(Alcohol) (Distillation apparatus)

YAKOVLEV, V. Ya.

Grinding feed yeast. Gidroliz. i lesokhim. prom. 11 no.5:26 '58.
(MIRA 11:9)

1. Priozerskiy sul'fitno-spirtovoy zavod.
(Yeast)

YAKOVLEV, V.Ya.

Operational experience of a yeast section. Gidroliz. i lesokhim.prom. 11 no.8:22-23 '58. (MIRA 11:12)

1. Priozerskiy sul'fitno-spirtovoy zavod.
(Yeast)

LEVIT, L.B.; YAKOVLEV, V.Ya.

Organizing the production of a refined viscose pulp. Bum. prom. 37 no.1:23-25 Ja '62. (MIRA 15:1)

1. Priozerskiy tsellyuloznyy zavod.
(Woodpulp)
(Viscose)

KARPOVSKIY, I.D.; YAKOVLEV, V.Ya.

Redesigning of the electric motor of the welding generator to a single-armature transformer. Rats. predl. na gor. elektrotransp. no.9:74-76 '64. (MIRA 18:2)

1. Sluzhba puti Tramvayno-trolleybusnogo upravleniya Leningrada.

YAKOVLEV, V.Z., inzh.

Rigging winch used in making up barge trains. Rech.transp. 18 no.12:48 D '59. (MIRA 13:4)
(Winches) (Towing)

YAKOVLEV, Ya.

IVERONOVA, V. I.; KALASHNIKOV, S. G.; YAKOVLEV, Ya.

Physics

Course in general physics. Vols. 1-3. Ye. S. Frish. A. V. Timoreva. Reviewed by V. I. Iveronova, S. G. Kalashnikov, Ya. Yakovlev. Sov. kniga No. 2, 1953.

Monthly List of Russian Accessions, Library of Congress, June 1953. Uncl.

YAKOVLEV, Ya.; SHAPIRO, R.

Patronage of the veterans of labor. Prof.-tekh. obr. 22 no.10: 10-11 O '65. (MIRA 18:10)

1. Direktor Professional'no-tekhnicheskogo uchilishcha No.47, g. Lugansk (for Yakovlev). 2. Pomoshchnik direktora po kul'turnovospitatel'noy rabote Professional'no-tekhnicheskogo uchilishcha No.47, g. Lugansk (for Shapiro).

YAKOVLEV, Ya.G., inzh.; FARBEROV, Ya.D., inzh.

Generalized theory and practice of operational organization of railroad yards ("Technical fundamentals of sectional and classification yard operation" by I.G. Tikhomirov. Reviewed by IA.; G. IAkovlev, IA.D. Farberov). Zhel. dor. transp. 41 no.2:95-96 F '59. (MIRA 12:3)

(Railroads--Yards)

BERNGARD, K.A., kandidat tekhnicheskikh nauk; KLEYNMAN, N.M., inzhener; NERSHIN, B.F., inzhener; FARBEROV, Ya.D., inzhener; YAKOVLEV, Ya.G., inzhener; DLUGACH, B.A., kandidat tekhnicheskikh nauk, redaktor.

[Progressive methods of breaking up and making up trains] Peredovye metody rasformirovaniia i formirovaniia poezdov. Moskva, Gos. transp.zhel-dor. izd-vo, 1954. 78 p. [Microfilm] (MIRA 10:1)
(Railroads--Making up trains)

TSIRKUNOV, Grigoriy Artem'yevich; YAKOVLEV, Ya.G., redaktor; BOBROVA, Ye.N., tekhnicheskiy redaktor

[Organization of the work of reshipment stations] Organizatsiia raboty stantsii peregruza. [Moskva] Gos.transp.zhel-dor.izd-vo, 1957. 122 p. (MIRA 10:9)
(Railroads--Stations)

YAKOVLEV, YA. G.

USSR/Engineering - Machinery

Card 1/1

Author : Yakovlev, Ya. G.

Title : Device for checking the cylindrical pulsation of excentric shafts

Periodical : Stan. i instr. 24/4, 33, April 1953

Abstract : A method is explained and illustrated by which prisms are attached to a device holding a shaft in such a way as to indicate wobble or pulsation in the shaft.

Institution : .....

Submitted : .....

GERASIMOV, Aleksandr Stepanovich, kandidat tekhnicheskikh nauk; YAKOVLEV, Ya.G., inzhener, redaktor; YUDZON, D.M., tekhnicheskiy redaktor

[Manual for train dispatchers and section officers] Rukovodstvo poezdnomu dispetcheru i dezhurnomu po otdeleniiu. Izd. 2-oe. Moskva, Gos.transp.zhel-dor.izd-vo, 1955. 354 p. (MIRA 9:3)
(Railroads--Train dispatching)

YAKOVLEV, YA. I., Maj.

PA 50T60

USSR/Medicine - Military
Medicine - Sterilization

Dec 1947

"Methods of Sterilizing Petri Dishes under Field Conditions," Maj Ya. I. Yakovlev, Med Corps, 1 p

"Voyenno-Medits Zhur" No 12

One effective method of sterilizing Petri dishes is by autoclaving for period of 30 - 45 minutes at pressure of 1 - 1½ atmospheres. Not very practical in many cases since the dishes crack and in any case, the dishes become covered with moisture. Under field conditions, even more impractical. Author describes simple effective method of sterilizing Petri dishes under field conditions.

LC

50T60

YAKOVLEV, Yaroslav Ivanovich, prepodavatel'; GUTTMAN, A.A., red.; BALLOD, A.I., tekhn.red.

[Handbook of practical work on pharmacology and prescription writing] Rukovodstvo k prakticheskim zaniatiiam po farmakologii s retsepturoi. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1958. 311 p. (MIRA 12:7)

1. Volokolamskiy veterinarnyy tekhnikum (for Yakovlev).
(Veterinary materia medica and pharmacy)

YAKOVLEV, Yaroslav Ivanovich; DREVLYANSKAYA, N.I., red.; PEVZNER, V.I., tekhn. red.; FEDOTOVA, A.F., tekhn. red.

[Pharmacology and prescription writing] Farmakologiia s retsepturoi. Moskva, Sel'khozizdat, 1963. 439 p. (MIRA 17:2)

YAKOVLEV, Ye. A. YAKOVLEV

USSR/Medicine - Sleep therapy conference

FD-1774

Card 1/1 Pub 122-6/9

Author : Yakovlev, Ye. A., Dr Biol Sci

Title : On the problem of sleep therapy

Periodical : Vest. AMN SSSR, 1, 54-57, Jan/Mar, 1955

Abstract : Successful development of sleep therapy requires a thorough study of physiological aspects of various soporific preparations and close cooperation among pharmacologists, physiologists, and clinicists. This was decided at the expanded session of the scientific council of the institute of physiology, Academy of Medical Sciences USSR, held jointly with scientific councils of institutes of pharmacology, neurology, surgery, pediatrics, and experimental medicine, Academy of Medical Sciences USSR. The session lasted from October 12 to October 15, 1954, during which period 30 reports were read. Soviet physiologists, pathophysiologists, biochemists, neuropathologists, psychiatrists, therapeutists, surgeons, pediatricians, and microbiologists have been conducting experiments for quite a while to determine the effects of sleep inhibition and sleep producing agents on the course of infectious processes in animal organisms.

Institution: --

Submitted : --

YAKOVLEV, E. A.

Fuel Abstracts
June 1954
Other Prime Movers

✓ 4634. GAS TURBINE. Yakovlev, E.A. (Nauka i Zhizn (Sci. & Life, Moscow), Aug. 1953, vol. 20, 17-20).

10/11/54 LM

YAKOVLEV, Ye.A.

Graphic and analytic calculation of the mean indicator-gauge pressure. Avt.trakt.prom. no.4:14-17 Ap '55. (MLRA 8:5)

1. Moskovskiy aviatsionnyy institut.
(Automobiles--Engines--Cylinders) (Gas and oil engines--Design)

YAKOVLEV, Ye.

Pneumatic starter for turbine-propeller engines. Grazhd.av. 12 no.8:38 Ag '55. (MIRA 15:8)
(Airplanes--Engines--Starting devices)

YAKOVLEV, Ye., inzhener.

DC-8 jet transport airplane. Grazhd.av. 12 no.9:39 S '55. (MLRA 10:7)
(United States--Airplanes--Turbojet engines)

~~YAKOVLEV, Ye., inzh.~~

An airplane with ring-shaped wings. Grazhd. av. 12 no.11:38 N '55. (MIRA 15:9)

(Airplanes--Design and construction)

YAKOVLEV, Ye.A., inzhener

High-speed aircraft. Nauka i zhizn' 22 no.6:17-20 Je '55.
(Jet planes) (MLRA 8:8)

YAKOVLEV, Ye. [A]

"Turboprop Engines," by Engr E. Yakovlev, Grazhdanskaya Aviatsiya, No 8, Aug 56, pp 20-22

Saying that the idea of creating a turboprop engine belongs to a Lt M. N. Nikol'skiy of the Russian Fleet, who in the period 1913-14 constructed a one-horsepower working model of such an engine, Yakovlev traces its development up to the present.

A detailed description of the operation and control elements of the component parts of the engine is presented. Thrust, fuel consumption, synchronization of controls, etc., are discussed. Several schematic drawings, an axial cross section of a modern engine, the control system of a modern engine, a controllable pitch propeller, and a cross-sectional diagram and a photograph of a Rolls Royce RB 109 turboprop engine, are included.

The author stresses the importance of the turboprop engine in civil aviation, particularly where speeds do not exceed 800 km per hour. He envisions their widespread use in multiplace planes.

Sum 1274

26.2311

25118
S/535/60/000/119/002/009
E191/E481

AUTHORS: Tikhonov, V.B., Candidate of Technical Sciences and Yakovlev, Ye.A., Engineer

TITLE: High temperature stabilized electric arcs of large power (electric arc plasmotrons)

PERIODICAL: Moscow. Aviatsionnyy institut. Trudy, No.119, 1960. Rabochiye protsessy v teplovykh dvigatel'nykh ustanovkakh, pp.43-70

TEXT: Stabilized high power electric arcs yield plasma jets with relatively simple engineering means under stationary conditions. They permit to simulate under laboratory conditions the phenomena of aerodynamic heating at large Mach numbers and to examine the properties of materials at high temperatures, apart from various experiments concerned with the physics of atoms and ions. A table of German and American plasmotron installations shows maximum temperatures in the channel up to 52000°K (Kiel University). German and American installations are described and their working principles explained. Some theoretical investigations are recited concerning the plasma of an arc discharge, based mainly on German literature. An account is given of the spectrographic analysis of
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25118

High temperature stabilized ... S/535/60/000/119/002/009
E191/E481

radiation in the channel and in the high temperature jet of an electric arc plasmotron carried out at the Moscow Aviation Institute. The effect of electromagnetic fields on the motion of plasma in the arc discharge channel is analytically examined. It is concluded that for the stabilization of the arc channel in plasmotrons, it is possible to use not only water or other liquids but also various gases (hydrogen, nitrogen, argon, air and others). In the practical utilization of electric arc plasmotrons for technical and physics work, the determination of the composition, temperature, velocity and other properties of the plasma assumes the greatest importance. The solution of these problems is associated with great difficulties of procedure and practical engineering. There are 16 figures, 2 tables and 25 references: 10 Soviet and 15 non-Soviet. The reference to an English language publication reads as follows: Elasser W., The Physical Review, 1954, Vol.95, No.1.

Card 2/2

TOLSTOV, A.N.; YAKOVLEV, Ye.A.

Consequences of not having considered the manifestation of solifluction. Stroi. v raion. Vost.Sib. i Krain.Sev. no.3:52-55 '62.

(MIRA 17:12)

PORTNOV, A.D.; RYABYY, V.A.; YAKOVLEV, Ye.A.

Measuring the average conductivity of high-ionized plasma by the radio-frequency method. Izv. vys. ucheb. zav.; av. tekh. 7 no.4:111-116 '64 (MIRA 18:1)

L 4112-66 EWT(1)/EWT(m)/EPF(c)/ETC/EPF(n)-2/EWP(t)/EWP(b)/EWG(m)/EPA(w)-2 IJP(c)

ACCESSION NR: AP5025995 JD/AT UR/0294/65/003/005/0799/0800

44,55 533.932:546.293

AUTHOR: Pustogarov, A. V. (Moscow); Yakovlev, Ye. A. (Moscow)

44,55 66

TITLE: The electric conductivity of an argon plasma

21,44,55 B

SOURCE: Teplofizika vysokikh temperatur, v. 3, no. 5, 1965, 799-800

TOPIC TAGS: electric conductivity, argon, plasma physics

ABSTRACT: This article is commentary on various published methods of calculating the electric resistance of an argon plasma, and contains no original experimental data. It consists of a comparative calculation by a formula given in Ginzburg, V. L., and Gurevich, A. V., Uspekhi fiz. nauk, 70, 201 (1960), and by the following expression:

$$\boxed{\sigma = \frac{e^2 n_e}{m_e (8kT/\pi m_e)^{1/2}} \bar{\lambda}_e = 3.78 \cdot 10^{-8} \frac{n_e}{\sqrt{T}} \left(n_0 Q_{e0} + Q_{e1} \sum_{i=1}^{m} n^{(i)}_i Z^2 \right)^{-1}, \text{мо/м}, \qquad (1)}$$

where e is the charge on an electron; m_e is the mass of an electron; $\bar{\lambda}_e$ is the

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L 4112-66

ACCESSION NR: AP5025995

mean length of the free path of an electron; k is the Boltzmann constant; n_0, n_e, and $n_i^{(z)}$ are the concentrations of atoms, electrons, and Z-charged ions, cm^2; Q_{e0} is the effective cross section of electron-atom interaction, cm^2; Q_{ei} is the effective crossion section of electron-ion interaction, cm^2; Z is the charge on an ion; and, T is the temperature, K. The comparison indicates that values of the electric conductivity of argon which are closer to the actual situation are obtained by the formula cited above and the Spitzer expression for Q_{ei}, rather than by the formula of Ginzburg and Gurevich. Orig. art. has: 2 formulas and 3 figures

ASSOCIATION: None

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: ME

NR REF SOV: 003 OTHER: 004

Card 2/2

18B300 24599 S/137/61/000/005/057/060
A006/A106

AUTHORS: Beskorovaynyy, N. M., and Yakovlev, Ye. I.

TITLE: Investigating corrosion of iron and chromium steels in liquid lithium

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1961, 60, abstract 5I454 (V sb. "Metallurgiya i metallovedeniye chistykh metallov", no. 2, Moscow, Atomizdat, 1960, 189-206)

TEXT: The authors established the solubility of Fe and Cr in Li depending on temperature. They show the low stability of Fe carbides and carbon austenite in liquid Li and the high stability of chromous carbides and alloyed austenite. Carbonization in liquid Li medium containing C (transfer of C) depends on the phase condition of the structural alloy at the test temperature. Admixtures of S and P increase corrosion failure of structural materials in liquid Li.

Ye. L.

[Abstracter's note: Complete translation]

Card 1/1

YAKOVLEV, Ye.I., starshiy nauchnyy sotrudnik, kand. tekhn. nauk

Similitude in case of a supersonic flow about bodies of revolution. Sbor. trud. Khab. avt.-dor. inst. no.1:16-22 '62. (MIRA 18:1)

DMITRENKO, V.I., dotsent (Khabarovsk); TILICHENKO, A.G., dotsent (Khabarovsk); YAKOVLEV, Ye.I., dotsent (Khabarovsk)

Computer center for the railroads of the Far East. Zhel.dor.transp. 45 no.2:80 F '63. (MIRA 16:2)

1. Rektor Khabarovskogo instituta inzhenerov zheleznodorozhnogo transporta (for Dmitrenko).
(Electronic computers)(Soviet Far East--Railroads--Making up trains)

YAKOVLEV, Yevgeniy Maksimovich; CHIRKOVA, Z.K., red.

[Blue roads] Golubye dorogi. Murmansk, Murmanskoe knizhnoe izd-vo, 1964. 51 p. (MIRA 18:3)

AUTHOR: Yakovlev, Ye. N. 20-4-18/60

TITLE: Calculation of the Magnetization of a Uniaxial Ferrite at Low Temperatures (Raschet namagnichennosti odnoosnogo ferrita pri nizkikh temperaturakh).

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 4, pp. 699-701 (USSR)

ABSTRACT: The energy of a ferrite consisting of two ferromagnetic sub-lattices can be represented in the form

$$\tilde{H} = -\frac{1}{2}\sum_{h_1h_2} I(h_1h_2)(S_{h_1}S_{h_2}) - \frac{1}{2}\sum_{h_1h_2}\Delta(h_1h_2)S^z_{h_1}S^z_{h_2}$$

. In this connection applies $\Delta(h_1h_2) = I_{zz}(h_1h_2) - I_{xx}(h_1h_2), I_{xx}(h_1h_2) = I_{yy}(h_1h_2)$; S_h signifies the spin of the node h, and OZ signifies the axis of the slight magnetization. The index h assumes the values $f_i(i = 1,.....N_1)$ for one ferromagnetic sub-lattice and the values g_i for all other sub-lattices. The first and the second sub-lattice have the spin S_1 and S_2 respectively and the difference $S_1 - S_2$ be of the same order of magnitude as S_1 and S_2. The exchange interaction between the ions of the different sub-lattices be considerably larger than the magnetic interaction, i.e. $\left|\frac{\Delta(h_1h_2)}{I(h_1h_2)}\right| \ll 1$. This ratio is here chosen as small para-

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This ratio is here chosen as small parameter. At low temperatures the Hamiltonian can, by the method of the approximate second quantizing by Bogolyubov-Tyablikov, be brought to the form $\tilde{H} = E_0 + \Delta E_0 + \tilde{H}_2$. The terms E_0 and ΔE_0 do not contain the operators of the Bose-statistics b_h, b_h^+ (where $b_h^+ b_h = n_h$ applies). In first approximation with regard to the above-mentioned parameter the energy of the system corresponds to a minimum at the absolute zero point, when the spins of one sub-lattice are opposed to the spins of the other sub-lattice. In a magnetic field the spins are turned, but stay antiparallel. When the field is square with the axis of anisotropy, the spins up to field intensities of the order of magnitude of the exchange field strengths remain antiparallel. When, however, the field strength without a change of direction alters to o and beyond it, a hysteresis is observed. That means the system of antiparallel spins does not change its position immediately, but only when the value $\mu H' = -1/\varkappa$ is reached. Then a formula is given for the magnetization in the temperature interval $|\Delta_{12}| \ll \vartheta \ll \vartheta_c \sim |\bar{I}_{12}|$. The magnetization in a field parallel with the axis of anisotropy changes at sufficient temperature in weak and strong fields like

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$M = M_0(1 - c\ T^{3/2})$ and $M = M_0(1 + c\ T^{3/2})$ respectively. The The causes of these modifications are discussed. There are 5 references, 3 of which are Slavic.

ASSOCIATION: Mathematical Institute AN USSR imeni V.A.Steklov (Matematicheskiy institut imeni V. A. Steklova Akademii nauk SSSR)

PRESENTED: April 5, 1957, by N. N. Bogolyubov, Academician

SUBMITTED: April 3, 1957

AVAILABLE: Library of Congress

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SOV/126-6-6-2/25

AUTHOR: Yakovlev, Ye. N.

TITLE: Calculation of Magnetization of Ferrites with a Single Magnetic Axis, As a Function of Temperature and Field (O raschete namagnichennosti magnitno-odnoosnykh ferritov v zavisimosti ot temperatury i polya)

PERIODICAL: Fizika metallov i metallovedeniye, 1958, Vol 6, Nr 6, pp 976-983 (USSR)

ABSTRACT: The paper developes a theory of magnetic anisotropy of ferrites with one magnetic axis. The theory is based on the approximate second quantization method, proposed by Bogolyubov and Tyablikov. Ferrites are represented as two uncompensated ferromagnetic sub-lattices, one inside the other (Neel's hypothesis - Ref.1). Vonsovskiy and Seidov (Ref.2) obtained a dependence of the type $M = M_o (1 - \text{const.}\ T^2)$, where M_o is magnetization at the absolute zero. This relationship is valid for ferrites with equivalent sub-lattices but with different magnetic moments of the sub-lattice sites. Kondorskiy et al. and Shiklosh (Refs.3,4)

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suggested a dependence of the type $M = M_0 (1 - const.T^{3/2})$ for non-equivalent sub-lattices with equal magnetic moments of their sites. A $T^{3/2}$-law was also obtained by Tyablikov (Ref.5). Tyablikov assumed that the sub-lattices are not equivalent and that the spins and the sub-lattice sites may have any value. Tyablikov considered fields of any value and calculated magnetization as a function of the field. The present paper continues Tyablikov's work. The author allows for the magnetic anisotropy of uniaxial ferrites. The anisotropic effects appear more strongly at applied magnetic fields of the order of anisotropy fields. Anisotropy is not important when the applied fields are of the order of the exchange fields and in that case ferrites are virtually isotropic. Anisotropy of magnetic properties of uniaxial ferrites is considered to be the result of anisotropy of the "exchange interaction tensor". The author calculates the magnetization of a ferrite crystal as a function of the field. He also derives hysteresis loops due to alternating magnetization of monocrystals at $T = 0^{\circ}K$. Temperature dependence of magnetization along the anisotropy axis and at right angles to it

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Calculation of Magnetization of Ferrites with a Single Magnetic Axis, As a Function of Temperature and Field

is obtained for temperatures close to the absolute zero. Fig.1a and Fig.1б show oscillograms, obtained by Bickford, of hysteresis loops on uni-axial magnetite. These loops were obtained in an alternating magnetic field of 60 c/s parallel (a) and at right angles (б) to the axis of easy magnetization. Fig.1 shows also the corresponding theoretical loops (a' and б'). Comparison of the theoretically calculated and empirical loops, shown in Fig.1, indicates that the theory proposed does not contradict experiment. The author's theory deals with a ferrite in which the exchange interaction between the nearest neighbours, that is, between the sites of the two sub-lattices, is large. This model is a fairly close representation of some real ferrites, but it is not the only one. The interaction between the ferromagnetic sub-lattices may be small in some ferrites. In this case total magnetization will be the sum of magnetizations of the separate sub-lattices, if the applied magnetic field is parallel to the anisotropy axis. If the applied field is perpendicular to

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the anisotropy axis, then the total magnetization is the difference between the separate magnetizations of the sub-lattices. In the latter case the spins may be re-oriented at low fields. In the case of weak coupling between the ferromagnetic sub-lattices, the hysteresis loops should be larger. The paper is entirely theoretical. Acknowledgments are made to S. V. Tyablikov for his advice. There is 1 figure and 9 references, 7 of which are Soviet, 1 English and 1 French.

ASSOCIATION: Matematicheskiy institut imeni V. A. Steklova AN SSSR (Mathematical Institute imeni V. A. Steklov, Academy of Sciences USSR)

SUBMITTED: February 4, 1957.

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Card 4/4

AUTHOR: Yakovlev, Ye. N. SOV/126-8-2-2/26

TITLE: Ferromagnetic Resonance in a Uniaxial Ferrite with Two Sublattices

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 2, pp 165-169 (USSR)

ABSTRACT: The ferrite is assumed to consist of two ferromagnetic sublattices. The total magnetic moment of the first sublattice is denoted by M_1 and that of the second by M_2. The exchange interaction between atoms belonging to different sublattices has an antiferromagnetic character. The interaction within each sublattice is ferromagnetic. In addition to the exchange interaction, there is an additional interaction which is responsible for the anisotropy. Only uniaxial anisotropy is considered. The axis of the anisotropy is taken along OZ. Each direction perpendicular to OZ is a direction of "difficult" magnetization. The invariant form for the energy of the system of two ferromagnetic sublattices is given by Eq(1). In Eq (1) the constants A_1, A_2, A are proportional to the exchange integrals. Moreover, A_1, $A_2 > 0$ (ferromagnetic

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interaction) and $A < 0$ (antiferromagnetic interaction). It is assumed that $\Delta_1, \Delta_2 > 0$, $\Delta < 0$ which ensures a minimum energy in the direction OZ. Since the exchange energy is much greater than the anisotropy energy, it follows that $\left|\frac{\Delta}{A}\right| \ll 1$. The ferrite specimen is taken to be an ellipsoid of revolution whose axis of revolution coincides with OZ. In this case the demagnetising field has the form

$$H_{0\alpha} = -N_\alpha (M_{1\alpha} + M_{2\alpha}) \quad (\alpha = x, y, z)$$

$$N_x = N_y = N \quad N_z \neq N.$$

If the energy of the specimen is calculated in the demagnetizing field, only the constants in Eq (1) are modified and no new terms are introduced. It follows that Eq (1) represents the energy of a uniaxial ferrite in the form of an ellipsoid of revolution. The description of the model is concluded by taking into account in Eq (1) the energy of the moments in the external field $H (M_1 + M_2)$.

The condition for the minimum of the energy F gives the equilibrium positions of $\vec{M}_1$ and $\vec{M}_2$. Near these equilibrium positions, the moments execute small precessions:

$$\delta \vec{M}_i(t) = \vec{M}_i(t) - \vec{\overline{M}}_i, \quad |\delta \vec{M}_i(t)| \ll \vec{\overline{M}}_i,$$

$$\delta M_{i\alpha}(t) = \delta M_{i\alpha} e^{i\omega t} \quad (i = 1.2; \ \alpha = x,y,z).$$

The corresponding frequencies are given by Eq (2). $\vec{H}_1$ are the effective magnetic fields which act on each sublattice. The effective fields can be obtained from the equations:

$$H_{i\alpha} = - \frac{\partial F}{\partial M_{i\alpha}} \quad (i = 1.2; \ \alpha = x, y, z)$$

The precession amplitudes are considered to be small and are taken into account in the linear approximation. The above model is used to calculate the resonance frequencies when the external magnetic field is perpendicular

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Ferromagnetic Resonance in a Uniaxial Ferrite with Two Sublattices

to the axis of easy magnetisation and when it is parallel to this axis. Eqs (5a) and (5b) give the frequencies in the radio range and Eqs (6a) and (6b) in the infrared region for the first of the above two cases. Eq (7) gives the radio frequency and Eq (8) the infrared frequencies for the second of the above two cases. L. F. Vereshchagin, S. V. Tyablikov and Ye. A. Turov are thanked for valuable advice. There are 4 references, 1 of which is Soviet and 3 English.

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR
(Institute of High Pressure Physics, Ac.Sc. USSR)

SUBMITTED: May 6, 1958 (Initially)
October 9, 1958 (After revision)

Card 4/4

S/126/60/009/05/004/025
E032/E514

AUTHORS: Izyumov, Yu. A. and Yakovlev, Ye. N.

TITLE: On the Theory of the Heisenberg Model of a Ferromagnetic with a Few Electrons Per Site

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, No 5, pp 667-672 (USSR)

ABSTRACT: In many cases the properties of ferromagnetics can be satisfactorily described by the simple Heisenberg model in which it is assumed that each lattice site can be characterized by the resultant spin s and that at absolute zero the spins are completely ordered. The Hamiltonian of such a system placed in a magnetic field H is usually written in the form given by Eq (1), where S_f is the spin operator for the site f and $J(f-f')$ is the exchange integral. At the present time only the lower eigenvalues of the operator given by Eq (1) are well known. These eigenvalues correspond to weakly excited states of the ferromagnetic which appear at low temperatures. It is very difficult to find a method for

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the accurate determination of all the eigenvalues and hence it is important to develop approximate method for solving this problem. Bogolyubov and Tyablikov (Ref 1) have successfully applied their method involving retarded and advanced statistical Green functions to the above problem and found an interpolation equation for the magnetization which gives its temperature dependence between the absolute zero and the Curie point. In their theory they confined their attention to the case $s = 1/2$, i.e. to a model in which there is only one electron per site. The present paper is concerned with the generalization of the results obtained by Bogolyubov and Tyablikov to an arbitrary spin s. It turns out that it is convenient to use not the spin operators but certain other dynamical variables b and b^+, which are defined by Eq (2). The first of the present authors has shown (Ref 3) that the b_f and b_f^+ operators must satisfy the additional commutation rules given by Eq (3).

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The b_f and b_f^+ operators are not Bose operators and obey the further relations given by Eq (4), where n_f is the occupation index. The retarded and advanced Green functions employed in the present generalization of the Bogolyubov-Tyablikov theory are defined by Eq (5), where $b_g(t)$ is the b_g operator on the Heisenberg representation, the square brackets indicate the commutator and the $\langle\cdots\rangle$ denotes an average over a statistical ensemble with a Hamiltonian $\underline{H}$, i.e.

$$\langle\cdots\rangle = \mathrm{Sp}\left\{e^{-\beta H}\cdots\right\}/\mathrm{Sp}\; e^{-\beta H};\ \beta = 1/kT$$

It is easy to show that the Green functions defined in this way obey the differential equation given by Eq (6), where h is the Planck constant divided by 2π and $\delta(t - t')$ is the Dirac δ-function. If the quantity

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$i\hbar \frac{db_g}{dt}$ is found from the equation of motion and then substituted into Eq (6), one obtains the differential equation given by Eq (7). In the case of $s = 1/2$ these results reduce to the equations given by Eqs (8) and (9), the latter equation being identical with that obtained by Bogolyubov and Tyablikov. Physically, the case $s > 1/2$ corresponds to the presence of a few electrons in the neighbourhood of a site which are in different orbital states λ. If it is assumed that the number of these electrons is z and in the ground state of the crystal, their spins are all parallel, then the resultant spin of a site will be $s = 1/2\ (z)$ and the spin operator of a site is made up of the spin operators for the separate electrons in accordance with Eq (10). Under these assumptions it is shown that the correlation function is given by an expression of the form of Eq (25).

Card 4/6 It is shown that the excitation spectrum of such a system

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contains, in addition to spin waves, high energy Bose branches which are the analogues of optical vibrations in solids when it is assumed that the elementary cell consists of a number of atoms. The presence of such branches in the energy spectrum of a real ferromagnetic, in which there are a number of "magnetic" electrons per atom, should be manifested in magnetic resonance absorption corresponding to transitions between energy levels with $k = 0$. In such cases an additional maximum should be observed at a frequency given by Eq (27), which in general lies in the infrared region. However, near the Curie point when σ is very small (σ is the relative magnetization; Eq (15)) this frequency may lie in the radio range. This situation is equivalent to the case of ferrites with a number of sub-lattices for which an analogous additional maximum has been observed. Acknowledgments are made to

Card 5/6 Corresponding Member of the Academy of Sciences, USSR

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E032/E514

On the Theory of the Heisenberg Model of a Ferromagnetic with a Few Electrons Per Site

S. V. Vonsovskiy for discussing the results and valuable suggestions.
There are 5 references, 4 of which are Soviet and 1 English.

ASSOCIATIONS: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, Ac.Sc., USSR) and Institut vysokikh davleniy AN SSSR (Institute of High Pressures, Ac.Sc., USSR)

SUBMITTED: December 9, 1959

Card 6/6

83132

S/020/60/133/005/009/019
B019/B054

24.3600

AUTHOR: Yakovlev, Ye. N.

TITLE: On the Excitation of the Spin System of a Ferromagnetic Medium by a Space-inhomogeneous Electromagnetic Field

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 5, pp. 1067 - 1069

TEXT: The author studies a ferromagnetic medium in which an inhomogeneous electromagnetic wave is propagated. This problem arises in the analysis of the magneto-optic effect. It is shown that in an inhomogeneous field a "resonance-suspicious" infrared emission of the frequency Ω = max $\varepsilon_q/\hbar \sim I/\hbar$ occurs beside the resonance frequency Ω = min $\varepsilon_q/\hbar = (g\mu/\hbar)H$, where ε_q is the energy of the spin wave, and I is the exchange integral. The author proceeds from the Hamiltonian (1) which corresponds to the Heisenberg model of a ferromagnetic medium, and with the aid of relations (2) and (3), respectively, for the Zeeman interaction energy, he obtains expression (4) for the variation rate of the energy of the spin system:

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$dE/dt = \sum_f h^x(f_z, t) d/dt\, \overline{(\delta m_g^x(t))}$, where m_g^x is a component of the magnetic moment, and h_x^x is the Zeeman interaction energy. From this equation, the author obtains relation (7) : $\Omega - [4I(1 - \cos aq_z) + 2\mu H](1/\hbar) = 0$; for $\Omega \simeq \min \varepsilon_q/\hbar = (2\mu/\hbar)H$, the classical resonance is obtained which was first studied by L. D. Landau and Ye. M. Lifshits (Ref. 1). At $\Omega \simeq \max \varepsilon_q/\hbar = (8I + 2\mu H)/\hbar$, resonance is possible in the infrared range. For estimating the energy absorbed, the author obtains relation (9) from which he calculates a value of about 10^{-4} at $I \sim 10^{-14}$ erg, $a \sim 10^{-8}$ cm, and T around 10^{-6} sec (T is the relaxation time of the spin component S_g^{α}). The author thanks L. F. Vereshchagin, S. V. Tyablikov, and G. S. Krinchik for discussing the physical problems, and S. V. Tyablikov for giving valuable advice for the mathematical work. There are 9 references: 7 Soviet, 1 Japanese, and 1 Dutch.

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On the Excitation of the Spin System of a Ferromagnetic Medium by a Space-inhomogeneous Electromagnetic Field

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ASSOCIATION: Institut fiziki vysokikh davleniy Akademii nauk SSSR (Institute of High-pressure Physics of the Academy of Sciences, USSR)

PRESENTED: April 12, 1960, by N. N. Bogolyubov, Academician

SUBMITTED: March 30, 1960

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YAKOVLEV, YE. N.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Mathematical Institute imeni V.A. Steklova, 1962:

"Several Generalizations of the Spinwave Method in the Theory of Ferromagnetism."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963. pages 119-145

S/181/62/004/001/028/052
B102/B104

AUTHOR: Yakovlev, Ye. N.

TITLE: Use of retarded and advanced Green functions in the theory of ferromagnetism

PERIODICAL: Fizika tverdogo tela, v. 4, no. 1, 1962, 179 - 184

TEXT: A method is proposed for calculating the spontaneous magnetization of a ferromagnetic with the use of retarded and advanced Green functions. This method has already been proposed by N. N. Bogolyubov and S. V. Tyablikov (DAN SSSR, 126, 53, 1959), and was used by Tyablikov (UMZh, 11, 287, 1959) for the same purpose. The difficulties arising in uncoupling the chains for the Green functions are shown to be solvable by using the perturbation theory. It is shown that already in first approximation results are obtained for spontaneous magnetization, which are similar to those of Dyson and Oguchi. The usual Hamiltonian

$$\mathcal{H} = -J\sum_{f,\delta} \mathbf{S}_f \mathbf{S}_{f+\delta} + Hg\mu \sum_f S_f^z \qquad (1),$$

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Use of retarded and advanced Green...

in which the S-operators are presented as proposed by Holstein-Primakoff (Phys. Rev. 58, 1908, 1940) and the $f_j(S)$ are expanded according to Oguchi, can be written as

$$\mathcal{H} = S\left\{-J\sum_{j,\delta} 2(a_j^+ a_{j+\delta} - a_j^+ a_j) - hg\mu\sum_j a_j^+ a_j + \right.$$
$$\left. + \varepsilon J \sum_{j,\delta}\left(\frac{1}{2} a_j^+ (n_j + n_{j+\delta}) a_{j+\delta} - n_j n_{j+\delta}\right)\right\};\ h = \frac{H}{S}. \quad (7)$$

$\varepsilon = 1/S$; $a_k = N^{-1/2}\sum_j \exp(-ikj)a_j$. The retarded Green function

$$iG_{g,f}(t, t') = \theta(t - t')\langle[a_g(t), a_f^+(t')]_-\rangle = \langle\langle a_g(t)\,|\,a_f^+(t')\rangle\rangle, \quad (8)$$
$$\langle\ldots\rangle = Q^{-1}\,\mathrm{Sp}[\exp(-\mathcal{H}\beta)\ldots],\ \beta = (kT)^{-1},$$
$$Q = \mathrm{Sp}[\exp(-\mathcal{H}\beta)];\ a_g(t) = \exp(i\mathcal{H}t)\,a_g\exp(-i\mathcal{H}t).$$

is introduced, and the set

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$$i\frac{d}{dt}\langle\langle a_g(t)\,|\,a_f^+(t')\rangle\rangle = \delta(t-t')\langle[a_g, a_f^+]_-\rangle + \langle\langle i\frac{da_g(t)}{dt}\,\Big|\,a_f^+(t')\rangle\rangle. \quad (9)$$

is obtained for the Green functions. This set can be written as

$$\begin{aligned} i\frac{d}{dt}\langle\langle a_g|a_f^+\rangle\rangle = \delta(t-t')\delta_{fg} + S\Big\{-J\sum_\delta 2\,(\langle\langle a_{g+\delta}|a_f^+\rangle\rangle - \\ -\langle\langle a_g|a_f^+\rangle\rangle) - hg\mu\langle\langle a_g|a_f^+\rangle\rangle + \\ + sJ\sum_\delta\Big(\langle\langle n_g a_{g+\delta}|a_f^+\rangle\rangle + \frac{1}{2}\langle\langle n_{g+\delta}a_{g+\delta}|a_f^+\rangle\rangle + \\ + \frac{1}{2}\langle\langle a_{g+\delta}^+ a_g^2|a_f^+\rangle\rangle - 2\langle\langle n_{g+\delta}a_g|a_f^+\rangle\rangle\Big)\Big\}. \quad (11) \end{aligned}$$

$\langle\langle a_g|a_f^+\rangle\rangle$ can be determined if the Green function of the next order, $\langle\langle n_g a_{g+\delta}|a_f^+ a_f^+\rangle\rangle$ is known, etc. Uncoupling is achieved with the help of

$$\exp(-\beta\mathcal{H}) = \exp(-\beta\mathcal{H}_0)\, S(\beta), \quad (12)$$

$$S(\beta) = \sum_{n=0}^{\infty} (-1)^n \varepsilon^n \int_0^{\beta} dt_1 \int_0^{t_1} dt_2 \ldots \int_0^{t_{n-1}} dt_n \mathcal{H}'(t_1) \ldots \mathcal{H}'(t_n).$$

and

$$i\langle\langle n_g a_{g+\delta} | a_f^+ \rangle\rangle = \theta(t-t')\langle [n_g a_{g+\delta}, a_f^+]\rangle =$$
$$= \theta(t-t')\, Q^{-1}\, \mathrm{Sp}\,\{\exp(-\beta\mathcal{H}_0)\, S(\beta)\, [n_g a_{g+\delta}, a_f^+]\} =$$
$$= \theta(t-t')\, Q^{-1}\, (\mathrm{Sp}\,\{\exp(-\beta\mathcal{H}_0)\, [n_g a_{g+\delta}, a_f^+]\} - \varepsilon\, \mathrm{Sp}\,\{\ldots\}), \quad (13)$$

results.

$$\langle\langle n_g a_{g+\delta} | a_f^+ \rangle\rangle \simeq \langle\langle n_g a_{g+\delta} | a_f^+ \rangle\rangle_0, \quad (\;)$$

is valid in first approximation with respect to ε. Wick's theorem is then applied to these functions, and with $\langle\langle a_g | a_f^+ \rangle\rangle = G_{g,f}(t,t')$ and $\langle\langle a_{g+\delta} | a_f^+ \rangle\rangle = G_{g+\delta,f}(t,t')$ one finds

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$$i\frac{d}{dt}G_{gf}(t,t')=\delta(t-t')\delta_{fg}+$$
$$+S\Big\{-J\sum_{\delta}2\left(G_{g+\delta,f}(t,t')-G_{g,f}(t,t')\right)-hg\mu G_{g,f}(t,t')+$$
$$+\varepsilon J\sum\Big\{\frac{1}{N}\sum 2\bar{n}_k(1-\exp(ik\delta))\left(G_{g+\delta,f}(t,t')-G_{g,f}(t,t')\right)\Big\}. \quad (16)$$

which, using the Fourier transform

$$G_{g,f}(t,t')=\sum_{q}\int_{-\infty}^{\infty}\exp[iq(g-f)]\exp[-iE(t-t')]\,dE,$$

(B), leads to

$$(E-E_q)G_q(E)=\frac{1}{2\pi}, \quad (17)$$

$$E_q=S\Big\{2J\sum_{\delta}(1-\exp(iq\delta))-hg\mu+$$
$$+\varepsilon J\frac{2}{N}\sum_{k,\delta}(1-\exp(ik\delta))(\exp(iq\delta)-1)\Big\}. \quad (18)$$

If $G_q(E)$ is known, the time correlation functions can be determined, and the following relation is obtained for the specific spontaneous magnetization (per atom):

$$\frac{M}{Ng\mu}=S-\langle n_f\rangle=S-\left\{\left(\frac{kT}{8\pi JS}\right)^{3/2}\zeta\left(\frac{5}{2}\right)+\frac{3}{4}\pi\left(\frac{kT}{8\pi JS}\right)^{5/2}\zeta\left(\frac{5}{2}\right)+\right.$$
$$\left.+\frac{33}{32}\pi^2\left(\frac{kT}{8\pi JS}\right)^{7/2}\zeta\left(\frac{3}{2}\right)+\frac{3\pi}{2S}\left(\frac{kT}{8\pi JS}\right)^{4}\zeta\left(\frac{3}{2}\right)\zeta\left(\frac{5}{2}\right)\right\}. \quad (22)$$

This result differs from that obtained by Dyson only in the factor (1+0.3/S), and from Oguchi's result in the factor (1+0.2/S). S. V. Tyablikov is thanked for discussions. There are 8 references: 3 Soviet and 5 non-Soviet. The four most recent references to English-language publications read as follows: F. J. Dyson. Phys. Rev., 102, 1217, 12[illegible], 1956; S. Oguchi, Phys. Rev. 117, 117, 1959; T. Matsubara. Progr. Theor. Phys. 14, 351, 1955; C. Bloch, C. de Dominicis. Nucl. Phys. 7, 459, 1958.

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR Moskva (Institute of the Physics of High Pressures AS USSR, Moscow)

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36467

24.4400

S/181/62/004/003/003/045
B102/B104

AUTHOR: Yakovlev, Ye. N.

TITLE: Damping of spin waves interacting with phonons

PERIODICAL: Fizika tverdogo tela, v. 4, no. 3, 1962, 594-600

TEXT: For an isotropic ferromagnetic the relaxation time of spin waves interacting with phonons is calculated with the help of retarded and advanced Green functions. The method used was elaborated by N. N. Bogolyubov and S. V. Tyablikov (DAN SSSR, 126, 53, 1959; UMZh, II, 287, 1959). The averaged relaxation time was calculated for the same problem by A. I. Akhiyezer et al. (ZhETF, 36, 272, 1959). The method applied here allows to determine the relaxation times for each spin wave separately. The interaction Hamiltonian

$$\mathcal{H}' = \sum_{\lambda\mu f s} A(\mu, \mathbf{f}, s)\, a_\lambda^+ a_\mu b_{fs} \Delta(\lambda - \mu - \mathbf{f}) + \text{к. с.}, \qquad (1,3)$$

$$A(\mu, \mathbf{f}, s) = i2SIa^2 \left(\frac{\hbar}{2V\rho\omega_f}\right)^{1/2} \{2\mu\mathbf{f}\mathbf{e}_{fs}(\mathbf{f}+\mu) + \mathbf{e}_{fs}(\mathbf{f}\mu^2 + \mu f^2)\}, \qquad (1,4)$$

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$$\Delta(\lambda-\mu-f)=\begin{cases}1 & \lambda-\mu-f=0,\\ 0 & \lambda-\mu-f\neq 0.\end{cases}$$

is considered as a perturbation of the Hamiltonian of the non-interacting system; $\mathcal{H}'$ is replaced by $\varepsilon\mathcal{H}'$ and expanded into a power series of ε, I is of the order of the exchange integral, $\omega_{\vec{f}} = |\vec{f}|\, c$, c - phonon velocity ($\mathcal{H} = \mathcal{H}_0 + \varepsilon\mathcal{H}'$). The Green functions of the system are developed and a closed system of equations for these Green functions is derived. The expression obtained for the attenuation of an "elementary" excitation

$$M_{\varkappa}''(E)=\pi\Big\{\sum_{fs}|A(\varkappa-f,\,f,\,s)|^2(1+\bar{n}_{\varkappa+f}+\bar{N}_f)\,\delta(E-(\varepsilon_{\varkappa-f}+\hbar\omega_f))+ +|A(\varkappa,\,f,\,s)|^2(\bar{N}_f-\bar{n}_{\varkappa+f})\,\delta(E-(\varepsilon_{\varkappa+f}-\hbar\omega_f))\Big\}. \qquad (2,10)$$

is then used for calculating the attenuation

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Damping of spin waves interacting... S/181/62/004/003/003/045
B102/B104

$$M''_{\varkappa}(\varepsilon_{\varkappa}) = \pi \frac{V}{(2\pi)^2} \frac{1}{\theta_c a^2} \sum_s \left\{ \int_{x_1}^{1} [|A(\varkappa - f, f, s)|^2 (1 + \bar{N}_f + \bar{n}_{\varkappa - f})]_{|f| = f_1} f_1' dx + \right.$$

$$\left. + \int_{-1}^{x_1(1)} [|A(\varkappa_1, f, s)|^2 (\bar{N}_f - \bar{n}_{\varkappa + f})]_{|f| = f_1} f_1 dx \right\}. \quad (3,1)$$

When the new variables

$$\left.\begin{aligned} &\pi \frac{V}{(2\pi)^2} \frac{1}{\theta_c a^2} \sum_s |A(\varkappa, f, s)|^2_{|f| = f_1} f_1 = 4F\varkappa^6 R(y), \\ &R(y) = \sum_{k=2}^{6} a_k y^k = y^2 (16y^4 + 16x_1 y^3 - 8(2x_1^2 + 1) y^2 - \\ &\quad - 4x_1 (4x_1^2 + 1) y + 8x_1^2 + 1), \\ &y = x - x_1; \quad F = \frac{1}{8\pi} \frac{\theta_c a^2 \hbar}{\rho c}. \end{aligned}\right\} \quad (3,2)$$

are introduced

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S/181/62/004/003/003/045
B102/B104

Damping of spin waves interacting...

$$M_{\varkappa}''(\varepsilon_{\varkappa}) = 4F\varkappa^{6}\left\{\int_{0}^{1-x_1} R(y)\left(1+\left[\exp\left(\frac{\theta_0^2}{\theta\theta_c}\frac{1}{x_1}y\right)-1\right]^{-1}+\right.\right.$$
$$+\left[\exp\left\{\frac{1}{\theta}\left[\frac{\theta_0^2}{\theta_c}\left(\frac{1}{4x_1^2}-\frac{y}{x_1}\right)+2\beta H\right]\right\}-1\right]^{-1}\right)dy+$$
$$+\int_{-1-x_1}^{0(1-x_1)} R(y)\left(\left[\exp\left(\frac{\theta_0^3}{\theta\theta_c}\frac{1}{x_1}(-y)\right)-1\right]^{-1}-\right.$$
$$\left.\left.-\left[\exp\left\{\frac{1}{\theta}\left[\frac{\theta_0^2}{\theta_c}\left(\frac{1}{4x_1^2}-\frac{y}{x_1}\right)+2\beta H\right]\right\}-1\right]^{-1}\right)dy\right\}.$$

is obtained. If $\varkappa \to 0$ and the temperature remains finite,

$$M_{\varkappa}''(\varepsilon_{\varkappa}) = 64F\frac{\theta\theta_c}{\theta_0}\varkappa_1^4\varkappa^8\sum_{n=1}^{\infty}\left(1-\exp\left(-\frac{n}{\theta}2\beta H\right)\right)\exp\left(-\frac{\theta_0^2}{\theta\theta_c}n\right).$$

Card 4/6

Damping of spin waves interacting... S/181/62/004/003/003/045
B102/B104

If $\theta \to 0$ and $\varkappa$ is finite,

$$M''_{\varkappa}(\varepsilon_{\varkappa})=4F\varkappa^6\sum_{k=2}^{8}\frac{a_k}{k+1}(1-x_1)^{k+1}+16F\varkappa_1^3\varkappa^3a_2\left(\frac{\theta\theta_c}{\theta}\right)^5,\ \varkappa>\varkappa_1,\ (\varkappa\neq\varkappa_1). \quad (3.3)$$

$$M''_{\varkappa}(\varepsilon_{\varkappa})=4F\varkappa^6\frac{\theta\theta_c}{\theta_0^2}x_1\exp\left[\frac{\theta_0^3}{\theta\theta_c}(1-x_1)\right]\sum_{k=2}^{8}a_k(x_1-1)^k\ (\varkappa\leqslant\varkappa_1). \quad (3.4)$$

In all cases, $\varepsilon_\varkappa \gg M''_\varkappa(\varepsilon_\varkappa)$. The relaxation time ($1/\tau_\varkappa \sim M''_\varkappa(\varepsilon_\varkappa)/\hbar$) varies within a broad range and depends on the temperature and the wave number $\varkappa$. Also at absolute zero τ remains finite for spin waves with $\varkappa > \varkappa_1$.

S. V. Tyablikov is thanked for discussions. There are 1 table and 10 references: 8 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: T. Holstein, H. Primakoff. Phys. Rev. 58, 1908, 1940; C. Bloch, C. De Dominicis. Nucl. Phys., 7, 459, 1958.

Card 5/6

Damping of spin waves interacting... S/181/62/004/003/003/045
B102/B104

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR Moskva (Institute of High-pressure Physics of the AS USSR, Moscow)

SUBMITTED: September 25, 1961

Card 6/6

S/181/62/004/006/031/051
B108/B138

AUTHOR: Yakovlev, ~~Ye. N.~~

TITLE: Resonance absorption of inhomogeneous electromagnetic radiation in ferromagnetics

PERIODICAL: Fizika tverdogo tela, v. 4, no. 6, 1962, 1589-1596

TEXT: The resonance absorption in ferromagnetics at a frequency of an external radiation equal to the extreme value of the spin wave energy ε_k is studied. Such resonance arises when a ferromagnetic is in a spatially inhomogeneous electromagnetic field. Similar problems have been examined before. The new idea in this work is that the resonance should be observed on spin waves and that this could be a method of investigating the spin wave energy spectrum. For simplicity, the calculations are performed for an isotropic ferromagnetic. Resonance absorption occurs at frequencies $\Omega_* = \frac{1}{\hbar}$ extrem ε_k. The attenuation of extremely short spin waves due to spin wave interaction is also considered.

Card 1/2

Resonance absorption of ... S/181/62/004/006/031/051
B108/B138

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR, Moskva (Institute of High Pressuré Physics AS USSR, Moscow)

SUBMITTED: February 7, 1962

Card 2/2

S/020/62/144/002/007/028
B104/B102

AUTHORS: Tyablikov, S. V., and Yakovlev, Ye. N.

TITLE: A generalization of the spin-wave method

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 2, 1962, 303-306

TEXT: If the Hamiltonian of the spin system of an isotropic ferromagnetic takes account of the interaction among closest neighbors only, it takes the form

$$\mathcal{H} = -\mu\mathcal{H}\sum_{(f)} S_f - I\sum_{(f,\delta)} S_f^z S_{f+\delta}^z,$$

where f is the vector of the lattice point, δ is the vector linking a given lattice point with its closest neighbor, I is the exchange integral, μ is the magnetic moment of a lattice point, and S_f^α is the component of the spin operator. Where $S \gg 1$ (T. Oguchi, Phys. Rev., 117, 117 (1960)), (1) can be expanded according to powers of S^{-1}. The Hamiltonian is then

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transformed according to T. Holstein, H. Primakoff (Phys. Rev. 58, 1098 (1940)) and reduced to

$$\mathcal{H} = A + \sum_{(k)} E_k a_k^+ a_k +$$
$$+ \varepsilon \frac{Iz}{2N} \sum_{(k_1, k_2, k_3, k_4)} \Delta(k_1 + k_2 - k_3 - k_4) \Big[(\gamma_{k_1} + \gamma_{k_2} - 2\gamma_{k_4 - k_2}) +$$
$$+ \frac{\varepsilon}{8S}(\gamma_{k_1} + \gamma_{k_2}) \Big] a_{k_1}^+ a_{k_2}^+ a_{k_3} a_{k_4} + \varepsilon^2 \frac{Iz}{16SN^2} \sum_{(k_1, \ldots, k_6)} \Delta(k_1 + k_2 + k_3 - k_4 - k_5 - k_6) \times$$
$$\times (\gamma_{k_1} + \gamma_{k_4} - 2\gamma_{k_3 - k_5 - k_6}) a_{k_1}^+ a_{k_2}^+ a_{k_3}^+ a_{k_4} a_{k_5} a_{k_6},$$

Here,

$$A = -\mu HN + 2IzS^2N, \quad E_k = \mu H + 2IzS(1 - \gamma_k),$$
$$\gamma_{k_i} = \frac{1}{z} \sum_{(\delta)} e^{i(k,\delta)}, \quad \Delta(x) = \begin{cases} 1, & x = 0, \\ 0, & x \neq 0, \end{cases}$$

in which N and z are the number of lattice points and of neighbors, respectively. A method due to S. V. Tyablikov (Ukr. matem. zhurn., 11, 287 (1959)) is applied in order to obtain perturbation-theoretical solutions of equations for Green's two-time temperature functions. The solutions are used to calculate energy and attenuation of the spin waves.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR (Institute of Mathematics imeni V. A. Steklov of the Academy of Sciences USSR)
Institut fiziki vysokikh davleniy Akademii nauk SSSR (Institute of High-pressure Physics of the Academy of Sciences USSR)

PRESENTED: December 25, 1961, by N. N. Bogolyubov, Academician

SUBMITTED: December 14, 1961

L 13020-63 EPF(c)/EWP(j)/EWT(m)/BDS Pr-4/Pc-4 JT/RM/WW
ACCESSION NR: AP3000409 S/0191/63/000/005/0075/0076

AUTHOR: Shcherbak, P. H.; Yakovlev, Ye. N.

64

TITLE: All-Union scientific-technical conference on the processing, physico-chemical bases, and research methods of polyolefins

SOURCE: Plasticheskiye massy*, no. 5, 1963, 75-76

TOPIC TAGS: polyolefins, pressure molding, extrusion, research methods, conferences

ABSTRACT: The conference, held in November 1962 in Leningrad, attracted 290 participants from factories, research and teaching institutes, etc. Twenty-three of the papers read at the processing section dealt with the technical aspects of producing polyolefin sheets, tubes, fittings, and other products by pressure molding, extrusion, and other methods. Nineteen papers dealt with physico-chemical properties and research methods, including data on mechanical, dielectric, and rheologic properties, aging problems, methods of thermo- and photo-stabilization, pigment selection, and compatibility. The article cites authors and topics of 37 papers. The conference recommended the organization of a plastics research and development center and resolved that the Academy of Sciences USSR should be requested to expand theoretical work on the physico-chemical bases of the production of polyolefins and other plastics.

Card 1/2

S/181/63/005/001/022/064
B102/B186

AUTHORS: Tyablikov, S. V., and Yakovlev, Ye. N.

TITLE: Generalization of the spin-wave method for finite temperatures

PERIODICAL: Fizika tverdogo tela, v. 5, no. 1, 1963, 137-141

TEXT: Bloch's spin-wave theory (Z. Phys. 61, 206, 1930) was first generalized by Dyson (Phys. Rev., 102, 1217, 1230, 1956), then applied by Opechocosky (Physica, 25, 476, 1960) and Oguchi (Phys. Rev. 117, 117, 1960). The authors here present a generalization obtained by applying perturbation-theoretical methods to the advanced and retarded Green functions for studying magnetization and the spin-wave energy spectrum at finite temperatures. The problem is reduced to finding the energy spectrum for Dyson's Hamiltonian of ideal spin waves and Oguchi's Hamiltonian: For spin-wave energy (ε_k) and attenuation (γ_k) in second approximation with respect to ε

Card 1/3

$$\tilde{\varepsilon}_k = \varepsilon_k - \frac{2Iz}{N}\varepsilon \sum_{k_1} (\gamma_0 + \gamma_{k+k_1} - \gamma_{k_1} - \gamma_k) \bar{n}_{k_1} - \frac{Iz}{SN^2}\varepsilon^2 P \sum_{k_1, k_2} \bar{n}_{k_1} \frac{(\gamma_{k_1-k_2} + \gamma_{k_2-k} - \gamma_{k_1} - \gamma_{k+k_1-k_2})^2}{\gamma_k + \gamma_{k_1} - \gamma_{k_2} - \gamma_{k+k_1-k_2}}; \quad (12)$$

$$\tilde{\gamma}_k - \pi \frac{Iz}{N^2}\varepsilon^2 \sum_{k_1, k_2} \bar{n}_{k_1} (\gamma_{k_1-k_2} + \gamma_{k_2-k} - \gamma_{k_1} - \gamma_{k+k_1-k_2}) \times \delta(\gamma_k + \gamma_{k_1} - \gamma_{k_2} - \gamma_{k+k_1-k_2}) \quad (13)$$

is obtained. If H=0, then

$$\tilde{\varepsilon}_k = \varepsilon_k \left(1 - \alpha\left(1 + \frac{0.2}{S}\right)\tau^{5/2}\right), \quad \tau = \frac{kT}{8\pi IS}, \quad \alpha = \frac{\pi}{S}\zeta\left(\frac{5}{2}\right) \quad (14),(a)$$

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ε_k is Bloch's energy,

$$\left.\begin{array}{l}\varepsilon_k = 2ISz(\gamma_0 - \gamma_k) + |\mu| gH, \quad \gamma_k = \frac{1}{z}\sum_\delta \exp(ik\delta), \\ \Gamma^\lambda_{\rho\sigma} = \sum_\delta \exp(i\lambda\delta)[1-\exp(-i\rho\delta)][1-\exp(i\sigma\delta)];\end{array}\right\} \quad (3),$$

and $\zeta = \zeta(x)$ is a Rieman function. The resulting expression for the temperature dependence of magnetization is analoguous to that of Dyson. In second approximation Dyson's and Oguchi's Hamiltonians lead to the same results.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova AN SSSR (Institute of Mathematics imeni V. A. Steklov AS USSR); Institut fiziki vysokikh davleniy AN SSSR, Moskva (Institute of the Physics of High Pressures AS USSR, Moscow)

SUBMITTED: May 3, 1962 (initially)
July 23, 1962 (after revision)

YAKOVLEV, YE. S. 4

The effect of twinning on the brittle fracture of zinc crystals. E. S. Yakovlev and M. V. Yakutovich. *Zhur. Tekh. Fiz.* 20, 420-8(1950); *Chem. Zentr*, 1951, II, 1704.—In Zn crystals under compression and so oriented that the hexagonal axis is parallel to the axis of stress, the process of twinning facilitates the breakdown if the deformation proceeds so well that slipping is not possible. It can be assumed that the same twinning process takes place when the hexagonal axis is perpendicular to the axis of stress.

M. G. Moore

MG

YAKOVLEV, YE. V.

ARYKIN, Ivan Grigor'yevich, kand.tekhn.nauk; VOSKRESENSKIY, Yuliy Sergeyevich, nauchnyy sotrudnik; LEBEDEV, Mikhail Petrovich, nauchnyy sotrudnik; SOKOLOV, Aleksandr Vasil'yevich, inzh.-konstruktor; FREYNKMAN, Isay Yefimovich, inzh,-konstruktor. Prinimali uchastiye: POPOV, A.I., kand.tekhn.nauk; YAKOVLEV, Ye.V., inzh.-konstruktor. LAZAREV, M.P., red.; POLTEVA, B.Kh., red.izd-va; PROKOF'YEVA, L.N., tekhn.red.

[Dredging streams used in timber rafting with the ZRS-1 dredging pump] Proizvodstvo dnouglubitel'nykh rabot na lesosplavnykh putiakh zemlesosno-refulernym snariadom ZRS-1. Moskva, Goslesbumizdat, 1959. 111 p. (MIRA 13:1)
(Dredging machinery)

YAKOVLEV, Yu.

USSR/Radio - Wired Radio Centers Nov 51
Hydroelectric Stations

"Radio at the Great Construction Projects," Yu. Yakovlev

"Radio" No 11, pp 15-17

An account of the radiofication work in progress at some of the construction projects, mainly around the Kuybyshev hydroelec station. A 500-w wired radio center has been constructed at the new city of Komsomol'sk on the Volga. Some data is given on the progress of the hydroelec station project itself, e.g., the construction plan for 1951 was fulfilled by 114% at the end of Aug 51.

208T65

AUTHOR: Yakovlev, Yu. (Fergana) 107-57-3-47/64

TITLE: Diffuser Repair. Experience exchange (Remont diffuzorov. Obmen opytom)

PERIDOICAL: Radio, 1957, Nr 3, p 45 (USSR)

ABSTRACT: A method for repairing a broken speaker diffuser is suggested. Gray blotting paper grated into pulp and mixed with BF-2 glue should be pasted over the damaged place and pressed for one to two hours until the pulp dries out.

Card 1/1

YAKOVLEV, Yu.

LEV, Ya.; KASHPUR, A.; YAKOVLEV, Yu.

Organize accounting for surpluses and deficiencies correctly.
Bukhg. uchet 15 no.5:25-27 My '58. (MIRA 11:5)
(Accounting) (Larceny)

YAKOVLEV, Yu.

They will succeed in achieving their goal. Mest. prom. i khud. promys. 3 no.8:4-5 Ag '62. (MIRA 15:10)

(Moscow--Textile industry)
(Efficiency, Industrial)

YAKOVLEV, Yu.; KOSOVETS, A. (Ozertso, Brestskoy obl.);
TOPIL'SKIY, V. (g. Shakhty, Rostovskoy obl.); DERNACHEV, B.
(Kinel', Kuybyshevskoy obl.); ORLOV, V. (Leningrad)

Readers' suggestions. Za rul. 21 no.2:25 F '63.
(MIRA 16:4)

(Motor vehicles—Technological innovations)

L 10100-63 EWT(1)/FCC(w)/BDS/ES(v)--AFFTC/ESD-3--Pe-4/Po-4--GW
ACCESSION NR: AN3001384 S/9032/63/000/136/0003/0003

66

AUTHOR: Yakovlev, Yuriy

TITLE: What are the origins of the moon?

SOURCE: Sovetskaya molodezh', 10 Jul 63, 3, cols. 5-7

TOPIC TAGS: origin of moon, satellite accumulation

ABSTRACT: Candidate of physics and mathematics Yevgeniyey Ruskol, a staff member of the Institut fiziki Zemli Akademii nauk SSSR (Institute of Physics of the Earth, Academy of Sciences SSSR) has advanced the hypothesis that some 200 million years after the formation of the earth, at a time when the earth had approximately half its present mass, the moon was formed from the accretion of swarms of small earth satellites at a distance of 5 to 10 earth radii from the planet. The hypothesis is built on the contemporary theory that the earth, like the other planets, was created out of cosmic "chunks"; this being the case, the earth as it formed must have been surrounded by such a swarm. The moon caused violent tides on the earth, which, as they subsided owing to friction, caused the moon to lose its energy and so to drift away from the earth. During this phase the moon encountered other showers of loose matter which, striking the surface of the

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L 10100-63

ACCESSION NR: AN3001384

satellite, created the so-called lunar seas. Objections have been raised to the new hypothesis on the grounds that were it correct the earth and moon would have to be of the same composition; no direct evidence exists to the contrary, but indirect evidence, such as the great difference in pressure in the central regions of the earth and the moon, argue against the validity of the hypothesis.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 09Aug63 ENCL: 00

SUB CODE: 00 NR REF SOV: 000 OTHER: 000

Card 2/2

BOGDANOV, Konstantin Aleksandrovich; YAKOVLEV, Yu.A., kand.tekhn.nauk, inzh.-gidrograf, spetsred.; FRISHMAN, Z.S., red.izd-va; KOTLYAKOVA, O.I., tekhred.

[Marine navigation charts; manual for merchant ship handling] Morskie navigatsionnye karty; posobie dlia sudovoditelei morskogo flota. Leningrad, Izd-vo "Morskoi transport," 1960. 147 p. (MIRA 13:7)

(Nautical charts) (Ship handling)

YAKOVLEV, Yu.A., kand.tekhn.nauk

Transformation of grid coordinates into geographical coordinates and vice versa by the use of electronic digital computers. Izv.vys.ucheb.zav.; geod.i aerof. no.1:59-64 '61. (MIRA 14:6)
(Coordinates) (Electronic digital computers)

S/194/62/000/006/060/232
D295/D308

AUTHORS: Mityushin, N.G., Kuz'min, I.L., and Yakovlev, Yu.A.

TITLE: Automatic temperature controllers with a semi-conductor pick-up

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract 6-2-146 ya (Tekstil'n. prom-st' no. 9, 1961, 72-73)

TEXT: The Tekstil'mashpribor factory manufactures the ЭАДРТ (EADRT) two-position and the ЭАТРТ (EATRT) three-position automatic temperature controllers. These are intended for the remote control of the temperature of a gaseous or liquid medium whether or not corrosive. The engineering characteristics of the controllers are the following: temperature-control range 20-100°C, control error 1.5 %, nominal valve lap 32 mm, nominal pressure of heat carrier up to 4 kg/cm2, feed voltage 220 V, 50 c/s, power consumption 100 W. The controllers consist of an electronic control device, a control valve, and semiconductor pickups. Advantages of the system are: high sensitivity, possibility of varying the width of the dead zone,

S/194/62/000/006/060/232
D295/D308

Automatic temperature controllers ...

simple design, small dimensions and weight of the elements, small power consumption. 4 figures. [Abstracter's note: Complete translation.]

Card 2/2

S/853/62/000/000/006/008
A006/A101

AUTHORS: Kononchuk, N. I., Yakovlev, Yu. A.

TITLE: Specific features in thermal fatigue tests of heat resistant materials

SOURCE: Termostoykost' zharoprochnykh splavov, sbornik statey, Ed. by N. M. Sklyarov Moscow, Oborongiz, 1962, 147 - 157

TEXT: Thermal fatigue is defined as the gradual failure and changes in shape of material of a specimen at alternate thermal stresses, which arise as a result of cyclic heating and cooling and of temperature differences over the sections of the specimen. Typical forms of thermal fatigue appear in parts of non-uniform thickness subjected to cyclic heat alternations, and in parts subjected to one-sided heating and subsequent cooling. Variable stresses in experimental cyclic heating and cooling can be excited by method I, when stresses of the 1st and 2nd order are uniformly distributed over the specimen cross-section, and by method II when these stresses are non-uniformly distributed. The selection of standard test methods must be based on the operational conditions of the part, the shape of specimens, test conditions, and criteria of thermal fatigue resist-

Card 1/2